

## CLAIMS

1. An essential oil obtained from natural and cultivated cold desert plant *Dracocephalum heterophyllum Benth* having high value of perfumery compounds, said essential oil  
5 obtained from:
  - (i) a natural plant comprising:  
cis-rose oxide 1.6%, trans-rose oxide 0.5%, citronellal 6.7%, citronellol 74.9%,  
geranial 1.5%, citronellyl acetate 6.7%, neryl acetate 0.7%, geranyl acetate 1.3%,  
spathulenol 1.5%, citronellyl-isobutyrate 0.8%, citronellol formate 0.2% and  $\alpha$ -  
10 bourbonene 0.4%.  
(ii) a cultivated plant comprising:  
benzaldehyde 0.2%, 6-methylheptanone 0.2%,  $\alpha$ -pinene 0.5%,  $\beta$ -pinene 0.2%,  
linalool 0.8%, cis-rose oxide 0.6%, trans-rose oxide 0.3%, citronellal 2.5%,  
citronellol 54.3%, neral 1.2%, geranial 2.4%, geraniol 1.9%, citronellyl acetate  
15 21.6%, neryl acetate 0.4%, geranyl acetate 11.7%,  $\beta$ -farnesene 0.1%,  $\delta$ -elemene  
0.5%, spathulenol 0.2% and citronellyl-isobutyrate 0.3%
2. The essential oil according to claim 1, wherein the constituents of said essential oil are identified by Gas Chromatography (GC) and Gas Chromatography Mass Spectra (GCMS).
- 20 3. The essential oil according to claim 1, wherein said oil content is a new commercial source for citronellol.
4. The essential oil according to claim 1, wherein said oil content is a new commercial source for cis and trans rose oxides.
5. The essential oil according to claim 1, wherein said oil content is a new commercial  
25 source for citronellyl acetate, geranyl acetate and citronellyl iso-butyrate.
6. The essential oil according to claim 1, wherein the yields of citronellol and rose oxide thus obtained are substantially higher than from any other *Dracocephalum* species.
7. The essential oil according to claim 1, wherein the chemo-type containing highest content of citronellol and rose oxides is designated as 6th type of chemo-type and  
30 named as citronellol, rose oxide type.
8. The essential oil according to claim 1, wherein the essential oil yield from *D. heterophyllum* is about 0.45% on fresh wt. basis.
9. A process of extraction of essential from a new plant source, *Dracocephalum heterophyllum Benth*, said process comprising the steps of:

- (a) charging plant material with water in a round bottom flask attached to Clevenger type apparatus;
  - (b) heating the plant material to a boiling temperature;
  - (c) condensing the vapor to separate the volatile oil from the upper layer of distillate to  
5 obtain the essential oil;
9. A process according to claim 9, wherein the essential oil yield from *D. heterophyllum* is about 0.45% on fresh wt. basis.
10. A process according to claim 9, wherein the plant material is selected from the whole plant.
- 10 11. A process according to claim 9, wherein the plant material is used obtained both from high altitude natural plants and from low altitude cultivated plants.

**AMENDED CLAIMS**

[received by the International Bureau on 25 July 2003 (25.07.03);  
original claims 1-11 replaced by amended claims 1-11 (2 pages)]

**CLAIMS**

1. An essential oil mixture yield of about 0.45% on fresh wt. basis obtained from natural and cultivated cold desert plant *Dracocephalum heterophyllum Benth* having high value of perfumery compounds namely citronellol and rose oxide, said essential oil mixture obtained from:
  - (i) a natural plant comprising:  
cis-rose oxide 1.6%, trans-rose oxide 0.5%, citronellal 6.7%, citronellol 74.9%, geranial 1.5%, citronellyl acetate 6.7%, neryl acetate 0.7%, geranyl acetate 1.3%, spathulenol 1.5%, citronellyl-isobutyrate 0.8%, citronellol formate 0.2% and  $\alpha$ -bourbonene 0.4%.
  - (ii) a cultivated plant comprising:  
benzaldehyde 0.2%, 6-methylheptanone 0.2%,  $\alpha$ -pinene 0.5%,  $\beta$ -pinene 0.2%, linalool 0.8%, cis-rose oxide 0.6%, trans-rose oxide 0.3%, citronellal 2.5%, citronellol 54.3%, neral 1.2%, geranial 2.4%, geraniol 1.9%, citronellyl acetate 21.6%, neryl acetate 0.4%, geranyl acetate 11.7%,  $\beta$ -farnesene 0.1%,  $\delta$ -elemene 0.5%, spathulenol 0.2% and citronellyl-isobutyrate 0.3%
2. The essential oil mixture according to claim 1, wherein the constituents of said essential oil mixture are identified by Gas Chromatography (GC) and Gas Chromatography Mass Spectra (GCMS).
3. The essential oil mixture according to claim 1, wherein said oil mixture content is a new commercial source for citronellol.
4. The essential oil mixture according to claim 1, wherein said oil mixture content is a new commercial source for cis and trans rose oxides.
5. The essential oil mixture according to claim 1, wherein said oil mixture content is a new commercial source for citronellyl acetate, geranyl acetate and citronellyl isobutyrate.
6. The essential oil mixture according to claim 1, wherein the yields of citronellol and rose oxide thus obtained are substantially higher than from any other *Dracocephalum* species.
7. The essential oil mixture according to claim 1, wherein the chemotype containing highest content of citronellol and rose oxides is designated as 6th type of chemotype and named as citronellol, rose oxide type.
8. A process of extraction of essential oil mixture from a new plant source, *Dracocephalum heterophyllum Benth*, said process comprising the steps of:

- (a) charging plant material with water in a round bottom flask attached to Clevenger type apparatus;
  - (b) heating the plant material to a boiling temperature;
  - (c) condensing the vapor to separate the volatile oil mixture from the upper layer of distillate to obtain the essential oil mixture;
9. A process according to claim 8, wherein the essential oil mixture yield from *D. heterophyllum* is about 0.45% on fresh wt. basis.
10. A process according to claim 8, wherein the plant material is selected from the whole plant.
11. A process according to claim 8, wherein the plant material is used obtained both from high altitude natural plants and from low altitude cultivated plants.

## Statement under Article 19

## IN THE INTERNATIONAL BUREAU OF WIPO

Re: International Application No. PCT/IB02/01205

Applicant: COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

International Filing Date: 25 March, 2002 (25-03-2002)

Title: ESSENTIAL OIL WITH CITRONELLOL AND ROSE OXIDES FROM  
*DRACOCEPHALUM HETEROPHYLUM BENTH* AND PROCESS THEREOF

Claim 1 has been made more specific by incorporating claim 8 describing the yield in percentage, i.e. 0.45% on fresh wt. basis. In addition to this, the main constituent of the perfumery compounds, namely citronellol and rose oxide, have also been mentioned. As such kind of disclosure was not in the cited arts, we believe that such modifications will help to overcome the Examiner's objections.

Claim 9 has also been amended by adding "oil" after ...essential ... Oil was missing from the initial set of claims. A mere typographical mistake.

The cited art relates to a bath composition with high foam forming ability used in personal hygiene, having *Dracocephalum* essential oil as one of the constituents but fails to indicate the constituents of the essential oil contributing to desired effect. Whereas, the present invention deals with extraction of essential oil from natural and cultivated species (cultivated under controlled conditions in the experimental farms) giving higher yield of citronellol, rose oxide, citronellyl acetate, geranyl acetate and citronellyl iso-butyrate.

The cited art is not disclosing any point that can be combined together with any other cited art to obtain the claimed effect. In fact, the present invention extracts the basic raw material, i.e. the essential oil with different constituents in high perfumery compound ratio. The said extracted essential oil is a raw material for different useful applications and the cited art is just one use of the extracted oil.

As the objectives of the present art is extraction of essential oil from the natural and cultivated plant and that of the cited art is its useful applications, both the documents are directing towards entirely different concept. In view of the above statement, we respectfully submit that obviousness rejection is invalid.